

DUAL DAMASCENE FLOWABLE OXIDE INSULATION STRUCTURE
AND METALLIC BARRIER

ABSTRACT OF THE DISCLOSURE

A method and structure for protecting a flowable oxide insulator in a semiconductor by oxidizing sidewalls of the FOX insulator, optionally nitridizing the oxidized FOX sidewalls, and then covering all surfaces of a trough or plurality of troughs in the FOX insulator, including the sidewalls, with a conductive secondary protective layer. In a multiple layer damascene structure, the surface of the FOX insulator is also oxidized, an additional oxide layer is deposited thereon, and a nitride layer deposited on the oxide layer. Then steps are repeated to obtain a comparable damascene structure. The materials can vary and each damascene layer may be either a single damascene or a dual damascene layer.